PLANTS AND PLANT COMMUNITIES OF JEAN LAFITTE NATIONAL HISTORICAL PARK, LOUISIANA.

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ABSTRACT

The 3240 hectare Barataria Unit (core area) of Jean Lafitte National Historical Park in southeastern Louisiana was surveyed phytosociologically and floristically. The park area has a wide range of natural habitats which were classified as marsh, cypress-tupelo swamp, intermediate swamp, and hardwood bottoms. The three forest types were analyzed by the point-quarter method to compare plant composition by differences in importance values. The hardwood bottoms are dominated by *Quercus nigra,* with *Liquidambar styraciflua, Celtis laevigata,* and *Quercus virginiana* as subdominants, while the cypress-tupelo swamp typically supports *Taxodium distichum, Nyssa aquatica* and *Fraxinus profunda.* The intermediate swamp supports species characteristic of both hardwood bottoms and cypress-tupelo swamps. The marsh habitat is quite diverse, the characteristically dominant species being *Sagittaria lancifolia, Persecaria punctata, Typha* spp., and *Eleocharis* spp.; *Spartina patens* dominates some areas. Aquatic and man-altered environments are described qualitatively. A checklist of vascular plants comprising 328 species in 88 families is included. No endangered or threatened species were found.

INTRODUCTION

The nation's newest national park, Jean Lafitte National Historical Park, was established in 1978 "in order to preserve for the education, inspiration and benefit of present and future generations significant examples of natural and historical resources of the Mississippi Delta region and to provide for their interpretation in such manner as to portray the development of cultural diversity in the region . . ." (U.S. Congress, Public Law 95-625, 1978). The park is unique in that it consists of a Barataria Unit of largely undisturbed vegetation and a number of "extended area units" of historical or cultural interest such as plantation houses, fortifications, and museums, all within the Mississippi Delta region. The Barataria Unit located ten miles south of New Orleans is itself divided into two areas, a "core area" of roughly 8,000 acres (3240 hectares) and an adjacent northern "park protection zone" of about 11,400 acres (4610 hectares). The present study is a baseline description of the plants and plant communities of the core area.

Study Area.

The core area of the Jean Lafitte National Historical Park is in Jefferson Parish on the southern border of the New Orleans metropolitan area. Its boundaries are irregular (Fig. 1). The western border is the shore of Lake Salvador, whereas the area is bounded on the south by bayous Barataria and Villars and on the east by Louisiana Highway 3134. The northeastern boundary is a hurricane protection levee and canal adjacent to zoned developed land, a part of greater New Orleans. The northern border is the edge of marshland that forms the park protection zone.

The core area is located midway on the

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eastern edge of the 400,000 hectare (990,000 acre) Barataria Basin (Fig. 2). Various ecological studies within the basin have been published in recent years (Conner & Day, 1976; Hopkinson et al., 1978; Day et al., 1973; Kirby & Gosselink, 1976). The basin is approximately 80 miles (129 km) long, with Lake Des Allemands near its headwaters and the Gulf of Mexico at its southern terminus. Several large, shallow lakes are encompassed by it. The lakes are interconnected by bayous and surrounded by extensive marshland which in turn is bordered by higher ground.

The eastern third of the core area is such an area of higher elevation bisected by Bayou des Familles. The high ground developed thousands of years ago from silt deposition when the bayou was an active distributary of the Mississippi River. The highest land (elevation about one meter m.s.l.) in the park is this natural ridge; east and west of it the elevation gradually declines until swamp and marsh is reached. Such elevational changes lead to the development of distinctively different plant communities within the study area.

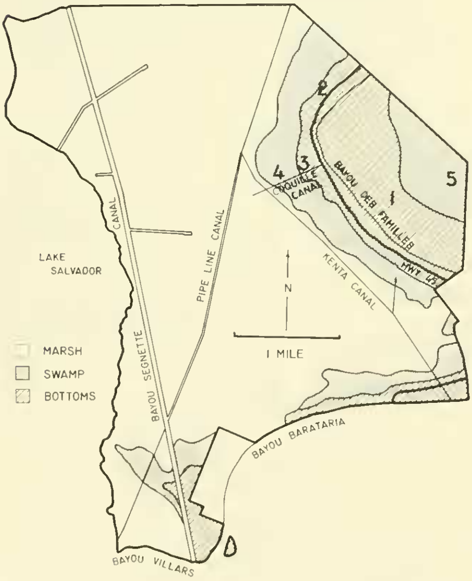

Figure 1. Map of core area, Barataria Unit, Jean Lafitte National Historical Park, showing distribution of major plant communities and location of the five study sites.

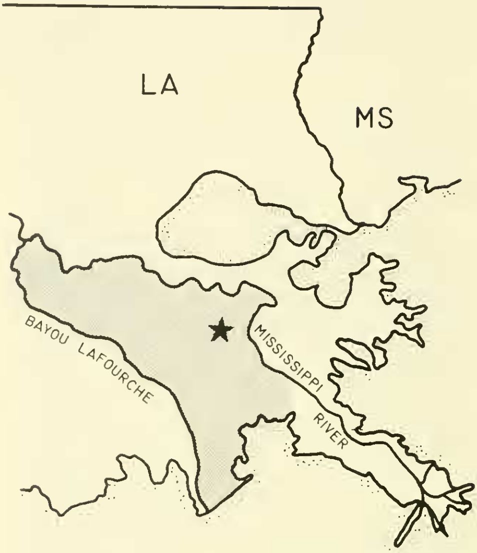

Figure 2. Map of southeastern Louisiana showing extent of the Barataria Basin and locality of core area.

Near and away from the Bayou des Familles is one of the southern-most bottomland forests in the United States. Man has not logged these during the last 50 to 75 years, although exact dates could not be verified (Norgress, 1936; Mancil, 1972). According to the classification of Braun (1950), two bottomland forest types are in the park. A "hardwood bottoms" community occurs on the highest land along both shores of Bayou des Familles, whereas "cypress-tupelo forests" occur east and west of the bottoms, also paralleling the bayou but on slightly lower ground. Between these two forest types is an intermediate swamp.

The park's western two-thirds is a marshland lying within the Barataria Basin. It is transected in several places by man-made canals and once by a high tension powerline. The Bayou Segnette Canal has numerous hunting, fishing, and weekend retreat camps along its shores, but the other canals have been largely untouched since construction.

Soils.

The core area has two distinct classes of soils. The eastern third has alluvial soils of the Inceptisols type supportive of hardwood bottom vegetation. The marsh vegetation in the western region grows in saturated peat and muck soils or Histosols. After winter and early spring rains, most Inceptisols remain saturated for weeks and even months in areas transitional to the marsh.

Climate.

The park is located in the subtropics where weather is strongly influenced by the close proximity of the Gulf of Mexico. Rainfall exceeds 160 cm (64 inches) annually, highest rainfall being in August and September. October is the driest month of the year. The mean annual temperature is approximately 21 °C (70 °F), ranging from a mean low in January of 11 °C (52 °F) to a July average of about 29 °C (84 °F). The growing season is in excess of 260 days.

METHODS

Over the course of two years the flora of Lafitte Park's core area was studied floristically and phytosociologically. Standard collecting and preparation techniques were employed in accumulating herbarium specimens to document the occurrence of plant species. More than twenty visits were made and all habitats studied, most more than once and at different seasons. Voucher specimens are deposited in the Tulane University Herbarium, although not all species are represented by specimens; when plants were found in a sterile condition, but identifiable in the field, no material was collected. This was especially the case for many trees and some aquatics.

Color infrared photographs were used to delimit plant communities within the park. Five general types of communities were found: (1) hardwood bottom, (2) intermediate swamp, (3) cypress-tupelo swamp, (4) marsh, and (5) man-altered. Open bodies of water support additional hydric communities. The bottomland forests were quantitatively sampled using 25 point-quarters (Cottam & Curtis, 1956; Cox, 1976) at each of five sites (Fig. 1). Two sites located 1.6 km apart were in hardwood bottoms on opposite ridges of Bayou des Familles. Two sites were in cypress-tupelo swamps also on opposite sides of and farther from the bayou. The final site was in an intermediate swamp. At all sites, species importance values were calculated using relative density and dominance values. Only woody plants with a stem diameter larger than 6 cm. at breast height were measured. The marsh, aquatic, and altered areas were studied qualitatively; i.e. estimates were made of species importance.

RESULTS

1. Description of plant communities.

An important environmental parameter controlling the distribution and composition of plant communities in the Lafitte Park is elevation of the land, which affects soil saturation and hydroperiod. Elevational differences of only a few centimeters result in striking changes in vegetation. Many thousands of acres of Louisiana are saltwater marshland, but salt intrusion is but a minor factor in the park, only minimally penetrating as far as southern Lake Salvador where tides are weak.

A. Hardwood bottoms. The hardwood bottom forests along Bayou des Familles comprise 437 hectares (1080 acres) of the 3240 hectare core area in the Barataria Unit and are dominated by water oak (*Quercus nigra*) (Fig. 3). Subdominants within these ridge forests include sweet gum (*Liquidambar styraciflua*), hackberry (*Celtis laevigata*), and live oak (*Quercus virginiana*). From the two hardwood bottom sites sampled, the average importance value (AIV) of each dominant and subdominant species mentioned above was 82, 33, 31, and 20 respectively (Tables 1 & 2). Such a species composition agrees with Braun's (1950) description of bottoms in the Mississippi Delta region. Also, as she states, "the southern aspect of this forest is emphasized by the abundant palmetto (*Sabal minor*)." Several other species that characterize these forests include box-elder (*Acer negundo*), honey-locust (*Gleditsia triacanthos*), American elm (*Ulmus americana*), and Nuttall oak (*Quercus nuttallii*).

The most common shrub species in the hardwood bottoms are palmetto and green haw (*Crataegus viridis*). In some areas thickets of possum-haw (*Ilex decidua*) are found. Forest gaps support elderberry (*Sambucus canadensis*) and French-mulberry (*Callicarpa americana*). Occasionally the introduced camphor-tree (*Cinnamomum camphora*) is found. Vines are quite striking and common, including poison-ivy (*Rhus toxicodendron* var. *vulgaris*), Virginia creeper (*Parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*), pepper-vine (*Ampelopsis arborea*), muscadine (*Vitis rotundifolia*), and hemp-weed (*Mikania scandens*).

Penfound and Howard (1940) reported results from a phytosociological study of a similar forest along an abandoned distributary located approximately 30 miles northeast of our study site. They found the dominant species to be water oak and live oak, with hackberry as the only important subdominant. Although sweet gums were not recorded there, several of the minor species are common to their study area and the Lafitte Park. Site differences probably result from local differences in seed recruitment.

B. Swamps. Lafitte Park has 445 hectares

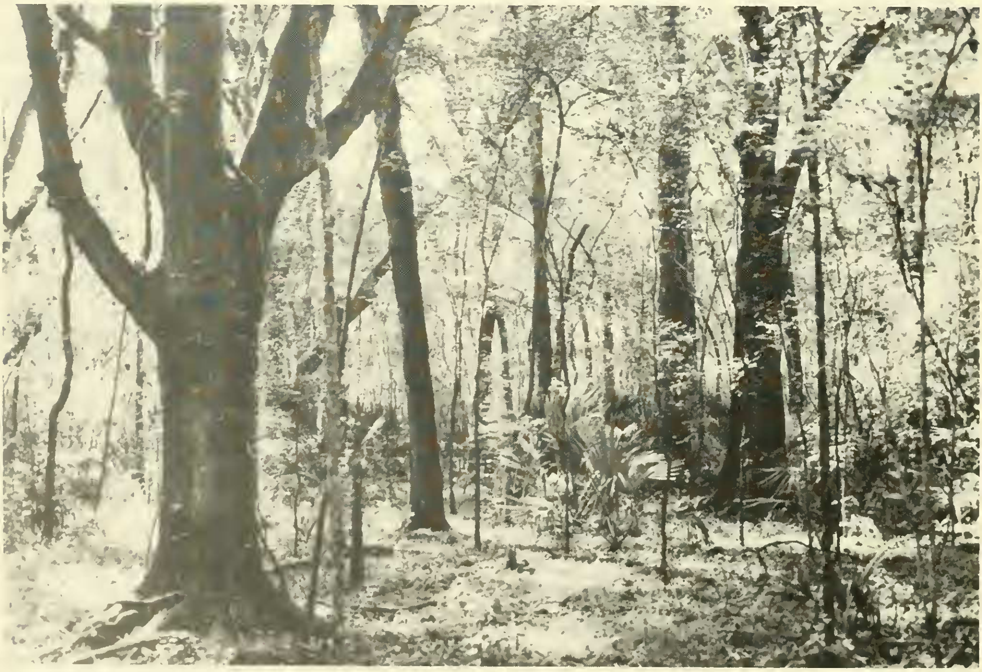

Figure 3. Hardwood bottom forest near site 1 in late autumn.

(1100 acres) of cypress-tupelo swamps. This community near the level of neighboring marshes is dominated by bald cypress (*Taxodium distichum,* AIV = 129) in areas where water level fluctuations have permitted re-establishment after logging (Fig. 4). Water tupelo (*Nyssa aquatica* AIV = 38) is often a sub- or co-dominant. Other sub-dominants are swamp red maple (*Acer rubrum* var. *drummondii,* AIV = 25) and ashes (*Fraxinus* spp., AIV = 24) (Tables 3 & 4). Shrubs within these swamps include wax-myrtle (*Myrica cerifera*) and buttonbush (*Cephalanthus occidentalis*). Here, the vines are cat-briar (*Smilax* spp.), trumpet-creeper (*Campsis radicans*), and poison-ivy.

Hall and Penfound (1939) studied a similar swamp forest located 45 miles northeast of Lafitte Park; Montz and Cherubini (1973) described an extensive, although less typical swamp with only one overstory species, bald cypress. Such anomalies probably result from differences in seed recruitment and germination.

In contrast to hardwood bottoms, the swamp forests have herbaceous ground cover. Some of the herbs are smart-weed (*Persicaria punctata*), alligator-weed (*Alternanthera philoxeroides*), swamp-potato (*Sagittaria lancifolia*), and water-hyacinth (*Eichhornia crassipes*). During the spring, patches of red iris (*Iris fulva*) and giant blue iris (*Iris giganticaerulea*) can be quite attractive beneath cypress laden with spanish-moss (*Tillandsia usneoides*); in the autumn the sunlit border swamps are covered yellow with bur-marigold (*Bidens laevis*).

The number of different species in the hardwood bottom forest is higher (richness = 9) than in the wetter swamp forests (richness = 5), probably because of the governing influence of water on germination and growth. Forests intermediate in elevation, i.e., those slightly less mesic than the hardwood bottoms, have the greatest number of species (richness = 14; Table 5). In Lafitte Park, the intermediate swamp occurs at an elevation between that of hardwood bottom and cypress-tupelo areas. Such intermediate swamp may be quite extensive due to gradual slope. Characteristically there is an abundance of swamp red maple, small American elms, and water oaks (Table 5). A few bald cypress can be found among the many other tree species. Here the palmetto understory is quite dense, often impenetrable, with plants up to 2 m. tall. A forest of this intermediate type and a wetter swamp forest in the upper drainage

TABLE 1. Importance values for trees in hardwood bottom--site 1.

Species	Number	Average Basal Area	Density/m^2	Relative Density	Dominance	Relative Dominance	Importance Value
Quercus nigra	47	385	0.034	47	13.1	32.9	79.9
Liquidambar styraciflua	14	640	0.010	14	6.5	16.3	30.3
Celtis laevigata	19	328	0.014	19	4.5	11.3	30.3
Quercus virginiana	2	8627	0.001	2	12.1	30.4	32.4
Acer negundo	4	130	0.003	4	0.4	1.0	5.0
Acer rubrum var. drummondii	1	350	0.001	1	0.2	0.6	1.6
Ulmus americana	10	215	0.007	10	1.6	3.9	13.9
Gleditisia triacanthos	1	2003	0.001	1	1.4	3.5	4.5
Cinnamomum camphora	2	29	0.001	2	0.1	0.1	2.1

TABLE 2. Importance values for trees in hardwood bottom--site 2.

Species	Number	Average Basal Area	Density/m^2	Relative Density	Dominance	Relative Dominance	Importance Value
Quercus nigra	16	2771	0.038	16	107.2	67.9	83.9
Liquidambar styraciflua	22	413	0.057	22	22.1	14.0	36.0
Celtis laevigata	24	195	0.051	24	11.3	7.2	31.2
Quercus virginiana	2	1899	0.004	2	9.1	5.8	7.8
Acer negundo	16	66	0.043	16	2.6	1.6	17.6
Acer rubrum var. drummondii	5	202	0.014	5	2.4	1.5	6.5
Ulmus americana	4	96	0.011	4	0.9	0.6	4.6
Ulmus rubra	10	88	0.023	10	2.1	1.3	11.3
Crataegus viridis	1	29	0.002	1	0.1	0.1	1.0

of the Barataria Basin were studied by Conner and Day (1976). Their species list compared with the one we compiled of species growing in similar environments demonstrates the relative homogeneity of these forest types in southern Louisiana.

C. Marsh. Ecologically a marsh is distinguished from a swamp by the lack of trees. Marsh is the largest community type within the Lafitte Park, covering approximately 2405 hectares (5945 acres). These areas of peat and muck soils have an elevation of less than one meter (m.s.l.), close to the level of Lake Salvador on which they border. Most of the marsh is sustained by trapped or slowly draining rainwater and contains diverse species of freshwater herbs. However, the occasional influx of slightly saline water from the lower Barataria Basin has resulted in a small marsh of somewhat different species composition along the southeastern shore of Lake Salvador to the Bayou Segnette Canal (Fig. 5B). Brackish water does not penetrate beyond the levees of the canal. Penfound and Hathaway (1938) studied this same locality and called it a brackish marsh, although it is now more correctly labeled intermediate marsh (Chabreck, 1972). The region can be distinguished from the freshwater marsh by

TABLE 3. Importance values for trees in swamp--site 4

Species	Number	Average Basal Area	Density/m^2	Relative Density	Dominance	Relative Dominance	Importance Value
Taxodium distichum	31	1211	0.020	31	24.2	69.6	100.6
Nyssa aquatica	20	473	0.013	20	6.1	17.7	37.7
Acer rubrum var. drummondii	20	123	0.013	20	1.6	4.6	24.6
Fraxinus profunda	19	192	0.012	19	2.3	6.6	25.6
Liquidambar styraciflua	6	85	0.004	6	0.3	1.0	7.0
Myrica cerifera	4	53	0.003	4	0.2	0.4	4.4

the dominance of cord grass (*Spartina patens*). Common species along the lake shore are swamp-potato (*Sagittaria lancifolia*), salt-marsh mallow (*Kosteletzkya virginica*), and seaside goldenrod (*Solidago sempervirens*).

In the freshwater marsh (Fig. 5A), swamp-potato is ubiquitous, covering at least sixty percent of the area. Occasionally the species occurs in pure stands, but more commonly it is mixed with other associates, such as smart-weed (*Persicaria* spp.) and alligator-weed. The diversity within the marsh community can best be described by identifying those plant associations which are several hectares or just a few hundred square meters in area; in any one area the association may be as described below or mixed with other less common species.

Wax-myrtle "islands" are scattered in the northern and eastern portions of the marsh (Fig. 5A). Larger stands of this evergreen shrub shade a dense and homogeneous ground cover of spike-rush (*Eleocharis* sp.). The myrtle islands seem to float on the marsh inasmuch as jumping on them makes the entire island undulate.

Other distinct marshland associations of limited size include stands of wild-rice (*Zizaniopsis miliacea*) in the southeastern marsh. Scattered throughout the eastern marsh are massive sedge communities which include giant bulrush (*Scirpus californicus*), several species of spike-rush, and flat sedge (*Cyperus* spp.). Cat-tails (*Typha* spp.) grow throughout the marsh, and in several places occur in very large stands. Panic grass (*Panicum* spp.) is scattered throughout and may form nearly pure stands (particularly *P. commutatum*). In places saw-grass (*Cladium jamaicense*) may be associated with any of the above species.

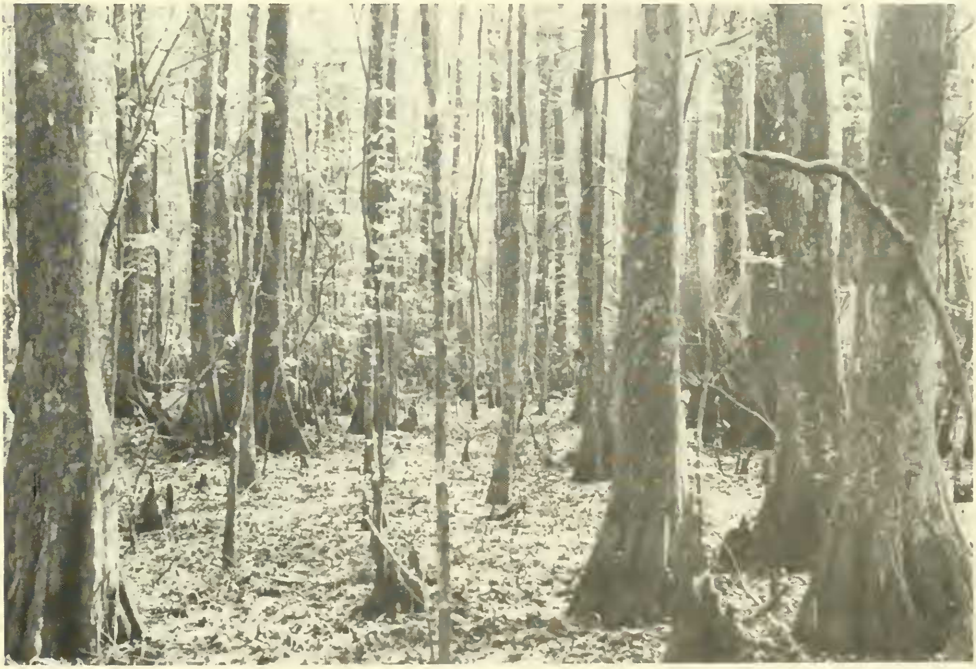

Figure 4. Bald cypress in swamp forest at site 5 in early spring.

TABLE 4. Importance values of trees in swamp--site 5.

Species	Number	Average Basal Area	Density/m^2	Relative Density	Dominance	Relative Dominance	portance alue
Taxodium distichum	63	1245	0.036	63	33.0	94.0	157.0
Acer rubrum var. drummondii	13	168	0.007	13	1.3	3.6	16.6
Fraxinus profunda	20	75	0.012	20	0.7	1.9	21.9
Liquidambar styraciflua	1	154	0.001	1	0.1	0.3	1.3
Myrica cerifera	3	51	0.002	3	0.1	0.2	3.2

D. Aquatic community. Except for rare small pools of water in the marsh, the only aquatic habitats are those of man-made canals, approximately 117 hectares (290 acres) of them (Fig. 6A). Canals were dug at widely different times spanning a period of fifty years, and thus are in varying states of their natural reversion to marshland. Coquille Canal is the oldest, and Bayou Segnette Canal the youngest; these differences in age are reflected in species composition. Plant communities in shallow, older canals have great diversity and density, even choking the canal, whereas younger, deeper canals have fewer species and much open water. Water-hyacinth, alligator-weed, and duck-weed (*Lemna* spp.) are very common floating and rooted-emergent aquatics. Fanwort (*Cabomba caroliniana*), coon-tail (*Ceratophyllum demersum*), and water-nymph (*Najas guadalupensis*) are the most common submerged aquatics.

E. Altered communities. The activities of

TABLE 5. Importance values for trees in transition forest--site 3. **Fraxinus profunda* and *F. pensylvanica* were sterile at the time of the survey and not distinguishable.

Species	Number	Average Basal Area	Density/m^2	Relative Density	Dominance	Relative Dominance	Importance Value
Acer rubrum var. drummondii	32	217	0.030	32	6.5	22.3	54.3
Ulmus americana	18	396	0.016	18	6.3	21.7	38.7
Quercus nigra	17	306	0.016	17	4.9	16.8	33.8
Liquidambar styraciflua	5	695	0.005	5	3.5	11.9	16.9
Quercus nuttallii	5	534	0.005	5	2.7	9.2	14.2
Quercus virginiana	5	470	0.005	5	2.4	8.1	13.1
*Fraxinus spp.**	7	229	0.007	7	1.6	5.4	12.4
Celtis laevigata	4	188	0.004	4	0.8	2.5	6.5
Crataegus viridis	2	70	0.002	2	0.1	0.5	2.5
Acer negundo	2	65	0.002	2	0.1	0.4	2.4
Taxodium distichum	1	255	0.001	1	0.3	0.8	1.8
Ilex decidua	1	34	0.001	1	0.1	0.1	1.1
Cornus drummondii	1	29	0.001	1	0.1	0.1	1.1

man have created several artificial communities within the Lafitte Park. The fact that some of these communities continue to be disturbed and others not enabled us to divide them into two categories based on their histories and present vegetation. In one instance the communities undergo succession toward compositions characteristic of their elevation and hydroperiod. Spoilbanks along shores of canals are such communities; not only do these artificial levees show successional transition from herbaceous vegetation to hardwoods, but there is a later succession to marshland as the spoilbank gradually subsides. An example of these stages in levee succession is found along the more than 80 year old Kenta Canal. The northern and extreme southern banks are covered with beautiful live oaks, sweet gums, and hackberries (Fig. 6A), a good example of late spoil succession and reminiscent of chenieres in southern Louisiana. In contrast, the central banks have further subsided nearly to the level of the surrounding marsh and here are found red bay (*Persea borbonia*), wax-myrtle, swamp red maple, and marsh-elder (*Iva annua*). As subsidence continues the woody plants will be replaced by herbaceous species now found in the marsh.

The youngest and driest spoilbanks along southern Bayou Segnette Canal and associated spur canals support a different vegetation dominated by roseau-cane (*Phragmites australis*), black willow (*Salix nigra*), goldenrod (*Solidago altissima*), and dewberry (*Rubus trivialis*) (Fig. 6B). The northern portions of Bayou Segnette Canal are unique in having pure stands of the introduced and weedy Chinese tallow-tree (*Sapium sebiferum*) (Fig. 5B).

The other type of altered community is that which is continuously disturbed by man, i.e., succession is prevented from following its normal course. Within Lafitte Park such areas include roadsides, powerline right-of-ways, and various commercial and industrial border areas. Here grow the same weedy plants found on young spoil, particularly thickets of dewberry, scattered black willow, seedlings of nearby forest species, various grasses, and numerous fall-flowering annuals such as asters, goldenrods, and other members of the composite family.

2. Floristic inventory.

The results of our floristic inventory of the core area of the Jean Lafitte National Historical Park are presented in the Appendix where 328 species of vascular plants are listed. Table 6 shows the distribution of species among the major plant groups including those families of flowering plants with the largest number of species in the park. The sequence of plant families and the botanical names used in the Appendix generally follow Correll and Johnston (1970); within each family the genera and species are arranged alphabetically. Common names are those believed to be in use in southern Louisiana, but different names may be applied in other parts of the country. A general statement following each name identifies the habitat in which the species was observed to be growing within the study area, although other habitats may be occupied by any species in other parts of its range.

The flora of Louisiana is not especially well known or documented when compared with that of our more northern states. Indeed, there is no modern published Flora which covers the entire state. Although a new Flora of the southeastern United States is in preparation, only the volume treating the composite family has been published thus far (Cronquist, 1980). Manuals covering other states with similar floras have proved most useful in the identification of our plant materials, particularly those of Radford et al. (1964) and Correll and Johnston (1970). Some more detailed studies of Louisiana plant groups are also available,

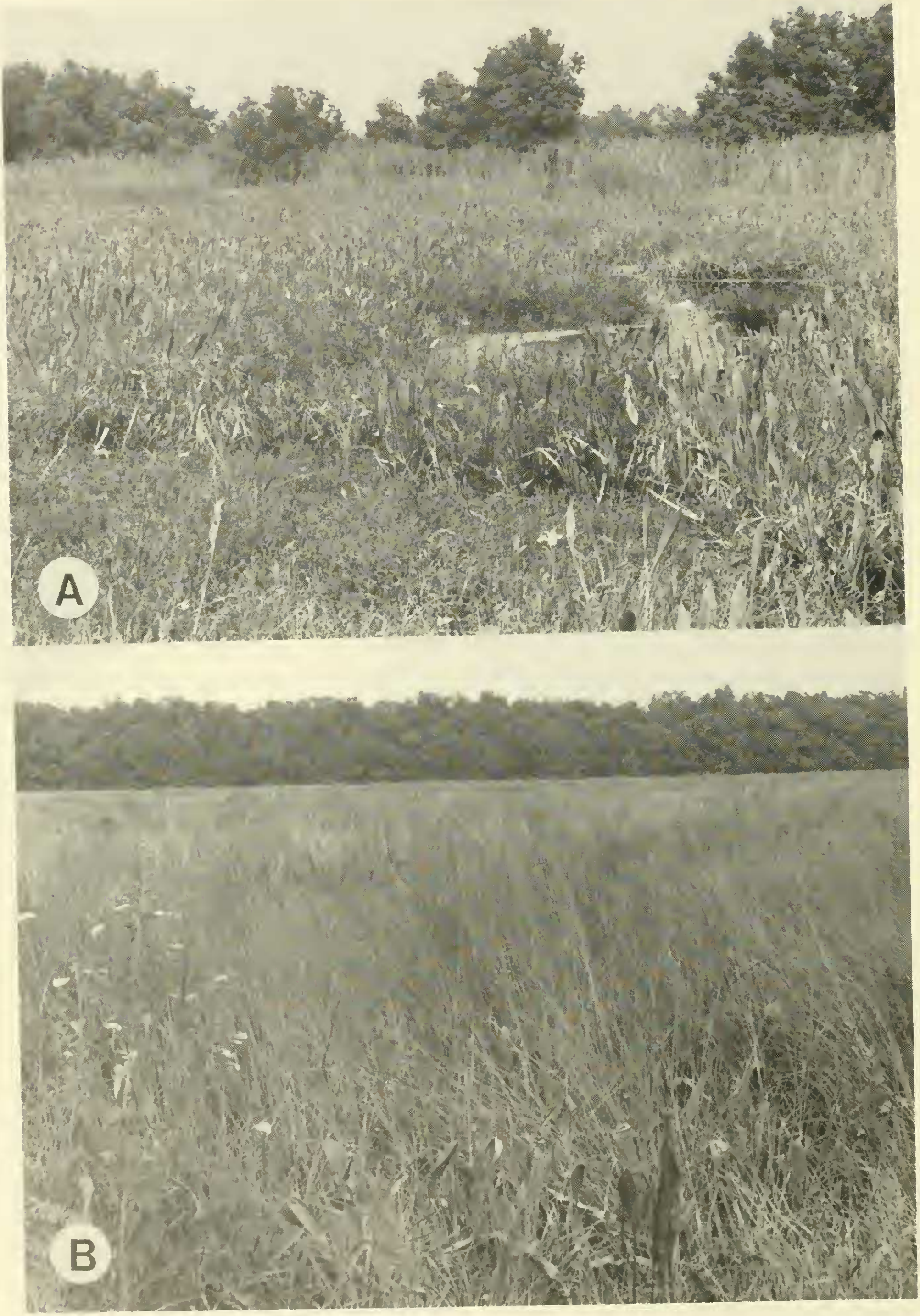

Figure 5. A: Freshwater marsh near Bayou Segnette Canal dominated by smart-weed and swamp-potato with islands of wax-myrtle in background. B: Intermediate marsh near shore of Lake Salvador dominated by cord grass with swamp-potato and salt-marsh mallow near shore; Chinese tallow-trees on spoilbank visible in rear.

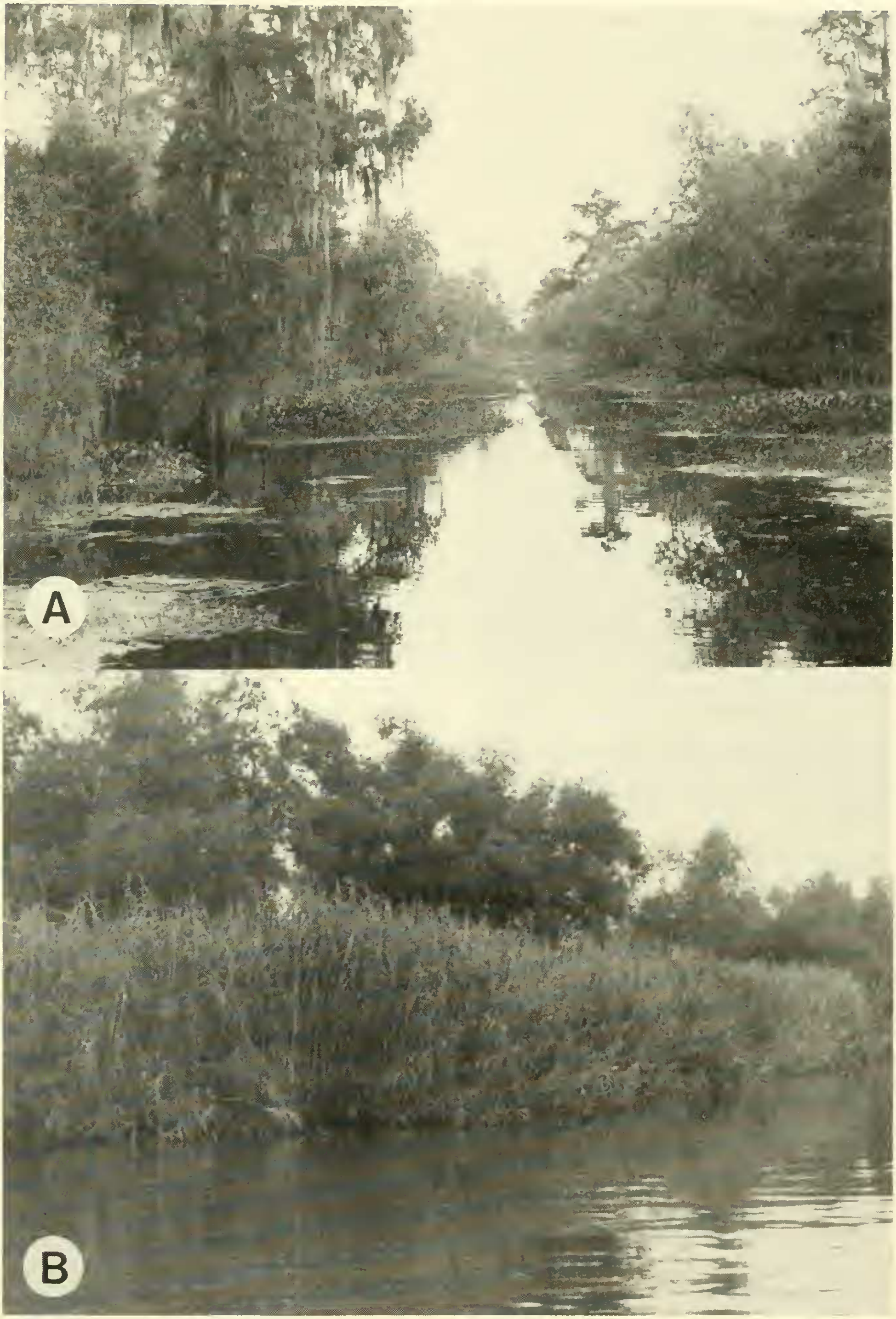

Figure 6. A: Kenta Canal showing water-hyacinth, alligator-weed, and duck-weed, bordered by mature spoil vegetation. B: Young spoil with black willow and roseau-cane along Bayou Segnette Canal.

e.g., those of Leguminosae (Lasseigne, 1973) and Gramineae (Allen, 1980), and they were consulted frequently. Other publications treat the aquatic vegetation of our area (Godfrey & Wooten, 1979, 1981), and checklists may supply valuable nomenclatural information (Thieret, 1972a, 1972b; Thomas & Allen, 1982).

Although we believe that our species inventory is substantially complete, no such list can ever be final. Aside from species that may have been overlooked, the vagility of plants suggests that various species may appear in the Lafitte Park as suitable habitats become available. Studying the vegetation near Bayou Villars in 1938, Penfound and Hathaway recorded the following plant species which we have not yet encountered in the study area: *Aster tenuifolius* L., *Calystegia sepium* (L.) R. Br. (*Convolvulus repens* L.), *Eleocharis albida* Torr., *Eleocharis montana* (HBK) R. & S. (*E. nodulosa* (Roth) Schultes), *Fimbristylis castanea* (Michx.) Vahl, *Iva frutescens* L., *Leptochloa fascicularis* (Lam.) Gray, *Lythrum lineare* L., *Paspalum vaginatum* Sw., *Scirpus olneyi* E. & G., and *Scirpus validus* Vahl. Any of the above species may be discovered within the Lafitte Park as the area continues to be explored botanically. Likewise, Montz (1980) has recorded the distribution of many aquatic plants in Louisiana. The following commonly occurring species which he records from Jefferson Parish have yet to be found within the park boundaries: *Myriophyllum brasiliensis* Camb., *Utricularia biflora* Lam., and *Zannichellia palustris* L. Similarly, we did not discover any species of *Wolffiella,* although they are common in waterways of the state.

Table 6. Major taxa present.

Taxon	*No. of species*
Pteridophyta:	5
Gymnospermae:	1
Angiospermae:	
Monocotyledonae:	
Gramineae:	37
Cyperaceae:	26
other families:	36
Dicotyledonae:	
Compositae:	33
Leguminosae:	21
Polygonaceae:	10
Euphorbiaceae:	8
Scrophulariaceae:	8
Umbelliferae:	8
other families:	135
Total:	328

No endangered or threatened plant species were encountered in the Lafitte Park, although some species are only occasional or rare, particularly *Asclepias perennis, Spiranthes cernua* var. *odorata, Habenaria repens,* and *Iris fulva.* Some woody plants which are rare in the park, such as species of *Citrus,* have escaped from cultivation. In general, however, the species found in the core area are representative of the southern Louisiana flora and the habitats that they occupy.

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LITERATURE CITED

ALLEN, C. M. 1980. Grasses of Louisiana. Univ. of Southwestern Louisiana, Lafayette, Louisiana.

BRAUN, E. L. 1950. Deciduous forests of eastern North America. Hafner Press, N.Y.

CHABRECK, R. H. 1972. Vegetation, water and soil characteristics of the Louisiana coastal region. Louisiana Agricultural Experiment Station Bulletin No. 664. Louisiana State Univ., Baton Rouge, Louisiana.

CONNER, W. H. and J. W. DAY, JR. 1976. Productivity and composition of a baldcypress-watertupelo site and a bottomland hardwood site in a Louisiana swamp. Amer. J. Bot. 63:1354-1364.

CORRELL, D. S. and M. C. JOHNSTON. 1970. Manual of the vascular plants of Texas. Texas Research Foundation, Renner, Texas.

COTTAM, B. and J. CURTIS. 1956. Use of distance measures in phytosociological sampling. Ecology 37:451-460.

COX, G. W. 1976. Laboratory manual of general ecology. Wm. C. Brown Co., Dubuque, Iowa.

CRONQUIST, A. 1980. Vascular flora of the southeastern United States, Vol. 1. Asteraceae. Univ. of North Carolina, Chapel Hill, N.C.

DAY, J. W., W. G. SMITH, P. R. WAGNER and W. C. STOWE. 1973. Community structure and carbon budget of a salt marsh shallow bay estuarine system in Louisiana. Center for Wetland Resources, Louisiana State Univ., Baton Rouge, Louisiana.

GODFREY, R. K. and J. W. WOOTEN. 1979. Aquatic and wetland plants of southeastern United States. Monocotyledons. Univ. of Georgia, Athens, Ga.

________. 1981. *Ibid.* Dicotyledons.

HALL, T. F. and W. T. PENFOUND. 1939. A phytosociological analysis of a cypress-gum forest in southeastern Louisiana. Amer. Midland Nat. 21:378-395.

HOPKINSON, C. S., J. G. GOSSELINK and R. T. PARRONDO. 1978. Above ground production of seven marsh plant species in coastal Louisiana. Ecology 59: 760-769.

KIRBY, C. J. and J. G. GOSSELINK. 1976. Primary production in a Louisiana Gulf Coast *Spartina alterniflora* marsh. Ecology 57:1052-1059.

LASSEIGNE, A. 1973. Louisiana legumes. Southwestern Studies: Science Series 1. Univ. Southwestern Louisiana, Lafayette, Louisiana.

MANCIL, E. 1972. An historical geography of industrial cypress lumbering in Louisiana. Ph.D. Thesis, 2 vol. Louisiana State Univ., Baton Rouge, Louisiana.

MONTZ, G. N. 1980. Distribution of selected aquatic plant species in Louisiana. Proc. Louisiana Acad. Sci. 43:119-138.

________ and A. CHERUBINI. 1973. An ecological study of a baldcypress swamp in St. Charles Parish, Louisiana. Castanea 38:378-386.

NORGRESS, R. E. 1936. The history of the cypress lumber industry in Louisiana. M.S. Thesis, Louisiana State Univ., Baton Rouge, Louisiana.

PENFOUND, W. T. and E. S. HATHAWAY. 1938. Plant communities in the marshlands of southeastern Louisiana. Ecol. Monogr. 8:1-56.

PENFOUND, W. T. and J. A. HOWARD. 1940. A phytosociological study of an evergreen oak forest in the vicinity of New Orleans, Louisiana. Amer. Midland Nat. 23:165-174.

RADFORD, A. E., H. E. AHLES and C. R. BELL. 1964. Manual of the vascular flora of the Carolinas. Univ. of North Carolina, Chapel Hill, N.C.

THIERET, J. W. 1972a. Checklist of the vascular flora of Louisiana. Part 1. Lafayette Natural History Museum Technical Bulletin 2. Lafayette, Louisiana.

________. 1972b. Aquatic and marsh plants of Louisiana: a checklist. Louisiana Soc. Hort. Res. 13 (1):1-45.

THOMAS, R. D. and C. M. ALLEN. 1982. A preliminary checklist of dicotyledons of Louisiana. Contr. Herbarium Northeast Louisiana Univ. 3. Monroe, Louisiana.

APPENDIX

Checklist of Vascular Plants

PTERIDOPHYTA

Schizaeaceae

Lygodium japonicum (Thunb.) Sw. CLIMBING FERN
Climbing over trailside and roadside vegetation

Salviniaceae

Azolla caroliniana Willd. WATER FERN
Floating aquatic in swamps